Massachusetts Community and State College Recycling: Bridgewater State College

FINAL REPORT
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Bridgewater State College Summary (Table 2)

Priority materials at BSC are a full mix of fibers (mixed paper plus cardboard) and beverage containers. We recommend that mixed paper and cardboard be collected and marketed together in a single (breakaway) compactor. Annual savings are projected to be approximately $14,000 per year with the purchase of a compactor, and approximately $10,000 per year with a 4-year lease-to-own of a compactor. (In this and in all cases, realizing these savings will be dependent on reducing the frequency and cost of trash pickup, adjusting for the tonnage that is diverted to recycling.) Additional savings can be realized by improving the efficiency of in-house collection procedures.

We also recommend that BSC's inefficient hand-sorting of beverage and food containers be eliminated, with the purchase of a covered rolloff container and processing at a regional Material Recovery Facility (MRF). The additional cost of this program (approximately $2,300 per year with purchase of a rolloff, $4,100 with a lease-to-own) will be largely offset by savings in labor.

We also recommend the purchase of approximately $7,700 in recycling supplies (deskside bins, wheeled containers, hampers) to expand the program to BSC dormitories and improve the on-campus flow of recycled materials.

We estimate that implementation of these recommendations can approximately double BSC's recycling rate, from about 16% to 30% or more.

Bridgewater State College

Recycling Status, Issues, and Opportunities
Bridgewater State College

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Current Status

Bridgewater State College (BSC) manages a fairly comprehensive recycling program that recovers mixed office paper, cardboard, food and beverage containers (plastic, glass, steel, aluminum), and universal wastes (fluorescents, ballasts, batteries). Most food wastes are taken by a local pigger, and other organics are composted on campus.

Among materials not recycled, BSC staff report that generation rates for scrap metal and wood waste are insufficient to merit dedicated recycling efforts; surplus property is managed through the state surplus system; and construction and demolition wastes are the responsibility of the Mass. Department of Capital Asset Management (for all construction other than small renovation projects that are managed in house). New computers and other electronic equipment are generally leased, with disposition managed by the supplier. However, BSC has a significant stockpile of older equipment in need of disposition, and there continues to be ongoing generation of older and non-leased equipment.

BSC's core recycling programs for fibers and containers are overseen by an employee in the school's Transportation Department, who devotes 1/4 to 1/3 of her time to recycling. Collection and handling of recyclables are undertaken by 8 part-time students, hired by BSC's Facilities Department but managed by the Transportation Department employee. No maintenance or other BSC professional staff are involved in collection of fibers or containers, although maintenance staff are responsible for collection and handling of universal wastes.

The commitment and experience of Facilities staff and the Transportation Department supervisor are among the greatest strengths of BSC's recycling efforts. With limited resources, they manage a program which addresses all of the major recyclable waste streams, and a collection infrastructure that reaches all of the administrative and classroom buildings on campus.

Issues / Opportunities

With the budget concerns facing the Massachusetts higher education system, BSC looks at this as a pivotal year for their recycling program. Recycling has been level funded for the past five years, while there has been upward pressure on costs (particularly for student labor), and competition for other resources needed to manage the program (e.g., vehicles to move recyclables on campus). With top management emphasis on justifying the cost of all campus programs, BSC believes that it must find ways to bring down recycling costs and/or increase the quantities captured, or face the potential loss of much – perhaps all – of its recycling program.

The programs which account for most of BSC's recycling costs, and generate the most recyclables, are its fiber and container programs. Looking forward, we believe these are the areas that should receive the most attention. Specifically:

Specific areas to be considered for potential improvement include:

- ***Improving Collection Efficiency – Paper***: The current system is labor intensive. Changes to handling practices can be implemented to reduce labor and costs.
- ***Broadening the Paper Specification***: The current paper program captures only mixed office paper, not newspaper, magazines, catalogues, junk mail, or other fibers. All of these streams – amounting to an "anything that tears" mix – should be added to the recycled fiber stream, increasing recycling tonnage without increasing costs.
- ***Expansion of Paper Recycling to Dormitories***: Paper is not currently recycled from BSC dormitories. A simple system with slot-top ottos in central areas would reach these buildings; additional smaller containers in student rooms would capture even more of the fiber stream.
- ***Consideration of a Compactor for Mixed Paper***: Additional efficiencies can be gained by depositing full "ottos" directly into a compactor, replacing the current system in which ottos are moved by hand at all points in the program.
- ***Improving Collection Efficiency – Containers***: With Material Recovery Facility (MRF) capacity available in southeastern Massachusetts, containers should be collected and recycled mixed, without the labor-intensive sorting and cleaning now in practice.
- ***Improved Reporting and Recordkeeping***: BSC's service provider (which handles both fibers and containers) does not provide accurate reporting of recycling tonnages and costs. BSC should insist on such reporting (specifically, detailed cost/revenue information on hauling and disposition of cardboard, mixed paper, and containers) so that it can better understand and seek to improve the cost effectiveness of its recycling efforts.

Of less immediate importance, but worth additional consideration in the future, are management concerns and recycling possibilities for surplus property, metal and wood waste, and computers/electronic equipment. According to BSC staff, these now add little to BSC's recycling or disposal tonange, disposal costs, or recycling costs.

Impacts

In 2002 BSC estimates that recycling tonnage included 88 tons of mixed paper, cardboard, and containers. Against solid waste disposal of 473 tons, this equates to a recycling rate of approximately 16%. This estimate excludes the recycling of food and leaf and yard wastes (which are composted on campus), and also excludes recycling and disposal of wastes from BSC's cafeterias (which are managed by a contracted food service provider, and not by BSC).

Based on industry estimates of campus waste composition, we believe that more aggressive recycling of fiber and containers (broadening the paper specification; expanding into dormitories) could capture another 10-15% of BSC's waste stream. At least as important, we believe that costs can be contained – and probably reduced significantly – by implementing more efficient alternatives for on-campus collection, processing, transportation, and marketing.

Bridgewater State College
Massachusetts Community/State College Recycling: Current Practices and Potential Modifications

Institution: Bridgewater State College — Site Visit Date: 6/3/03
Contact: Mary Cahill — Phone: 508-531-2094 — Email: mcahill@bridgew.edu

Material	Current Practice	Comments/Notes	Recommended Modifications
Mixed Office Paper (unshredded)	White and colored collected in deskside bins. Student workers empty bins into plastic bags. Students carry bags to "ottos" (toters) in basement of each bldg. Ottos are loaded onto lift gate stake truck (student driver). Ottos unloaded into storage container at recycling area. Vendor (Frade's) swaps empty for full toters. Frade's picks up with their own lift gate vehicle.	Very labor intensive. No paper recycling in dorms. All student labor; no maintenance involvement. No work study. All students paid market rates. Student labor is largest budget item. Concern re code issues (e.g., plastic containers filled with paper in unsprinklered areas).	1) Eliminate the bagging step. Office containers should be emptied directly to ottos or hampers rolled through hallways. 2) Consider possibility of using maintenance staff instead of student workers. 3) Go to "anything that tears" mix. 4) Add dormitory recycling. Slotted containers in common areas, possibly indiv. containers in student rooms. 5) Eliminate toter pickup. Evaluate purchase or lease of breakaway compactor with toter dumper. 6) Evaluate costs/benefits of recycling MP and OCC combined in one compactor.
Newspaper/Magazine Mix	Not recycled.		See above.
Confidential Documents	No organized program. Some shredded in offices and either discarded or added to office paper for recycling.		Confirm that all confidential information is being destroyed.
Cardboard	Collected in buildings with significant generation (food service, library, science, some others). Picked up on lift gate (student workers) and taken to s/c compactor in recycling area. Compactor is swapped when full by Frade's. Compactor leased from Frade's.	Currently pay $115 per pull on the compactor, see no revenue on the OCC, see no rental charge on the compactor. No tonnage reporting from Frades.	Evaluate costs/benefits of recycling MP and OCC combined in one compactor. Require better and regular reporting. OCC revenue and compactor rental cost should be made explicit, not a tacit "wash".

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Material	Current Practice	Comments/Notes	Recommended Modifications
Containers (beverage and tin cans)	Assigned to a single student worker. Collected in bags in recycling receptacles. Bags carried and emptied into ottos in basement. Ottos onto liftgate. Liftgate to 4-compartment rolloff in recycling area. Student hand sorts, hoses clean, and tosses individual containers into correct compartment. Frade's pulls rolloff (on-call, with few days' notice, 3x – 4x per year). Frade's replaces with same rolloff a couple of days later.	Little recycling in dorms. Some is managed by Resident Assistants (RA's) but inconsistent (only 3 dorms) and little tonnage is recovered. Believe that maintenance staff takes most of the redeemables. Largest volume is plastic (generally 2 of 4 compartments in rolloff. Rolloff often needs to be pulled when only partly full (one compt full, others close to empty). Very labor intensive.	Go to commingled collection (in bags) with haul to MRF. Collect and recycle containers from dormitories.
Scrap Metal	No organized program. Little regular generation. Handled by contractor or Mass. Dept of Capital Asset Mgmt for construction projects (see C&D). Occasionally maintenance will take to local metal dealer.		Consider 1x or 2x per year purge with dedicated container.
Wood Waste	No organized program. Little regular generation. Handled by contractor or Mass. Dept of Capital Asset Mgmt for construction projects (see C&D).		Pallet generation unknown. Confirm pallet use for shipping and receiving and consider recycling option if merited.
Computers/Electronic Equipment	State that most electronics are now leased, and disposal/recycling is handled by the supplier. However, there is a large stockpile of older equipment that needs to be recycled, and some continuing generation of equipment that is not leased.	Large stockpile to be recycled. Ongoing generation expected to be much less, but cannot estimate ongoing quantities until stored stockpile is eliminated.	Evaluate possibility of one-time purge for stored materials. Confirm that leasing is in fact dealing with all electronics, particularly CRTs and televisions (disposal ban), and CPUs (data security, environmental issues).
Fluorescent Lamps & Ballasts (Universal wastes)	Recycled through Onyx (state contract). Collected in fiber drums or OEM boxes, stored in each building. Onyx picks up 1x or 2x per year.		None recommended.

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Material	Current Practice	Comments/Notes	Recommended Modifications
Batteries	Recycled with universals (Onyx).		None recommended.
Surplus Property	Use state system. 1) Hold and evaluate for internal reuse; 2) Post to state system (other agencies, then other potential users); 3) OK to discard after many months.	Walk through suggests that non-trivial quantities are held in storage, and would benefit from more efficient triage and turnover.	
Construction/Demolition	Mass. Dept of Capital Asset Mgmt (DCAM) is manager/developer for all but small projects. Recycling (if any) is handled by DCAM, not BSC. No organized program to evaluate recycling for projects managed in house.		For projects managed in house, evaluate on project-by-project basis to determine if volume and value of materials warrant recycling.

Bridgewater State College
Cost of Recommended Recycling Program Enhancements

Fibers

Recommendation: Mixed Paper plus cardboard (commingled) to breakaway compactor.

Estimated Cost of Fiber Recycling Program, Bridgewater SC		
Item	**Units**	**Value**
Estimated Fiber Generation (MP + OCC)	Tons/Yr	300
Current Fiber Recovery	Tons/Yr	75
Additional Fiber Available for Recovery	Tons/Yr	225
Fiber Recycling Rate with Aggressive Program	Percent	75%
Estimated Fiber Recovery with Aggressive Program	Tons/Yr	225
Cost of Current Fiber Recycling Program (Estimate 24 hauls @ $115)	$$/Yr	$2,760
Breakaway Compactor		
Purchase	$$	$13,845
4-Year Lease-to-Own	$$/Yr	$4,217
Rental, Breakaway Compactor Box	$$/Yr	$1,440
Haul to Braintree	$$/Haul	$175
Tons Per Haul to Braintree	Tons/Haul	5.0
Total Hauls Per Year	Hauls/Yr	45.0
Total Annual Cost of Hauls to Braintree	$$/Yr	$7,875
Revenue, Mixed Paper + OCC	$$/Ton	$25
Total Annual Revenues, Mixed Paper + OCC	$$/Yr	$5,625
Avoided Disposal Cost (Haul + Tip)	**$$/Ton**	**$100**
Avoided Disposal Cost, Current Recycling Tonnage	**$$/Yr**	**$7,500**
Avoided Disposal Cost, Total with Aggressive Recycling Program	**$$/Yr**	**$22,500**
Annual Recycling Cost(Revenue) with Compactor Purchase	**$$/Year**	**$3,690**
Annual Recycling Cost(Revenue) with 4-Year Lease-to-Own	**$$/Year**	**$7,907**
Net Annual Cost(Savings) after Avoided Disposal Cost, Purchase	**$$/Year**	**($18,810)**
Net Annual Cost(Savings) after Avoided Disposal Cost, 4-Yr LTO	**$$/Year**	**($14,593)**
Net Annual Cost(Savings) after Avoided Cost, Accounting for Current Program, Purchase	**$$/Yr**	**($14,070)**
Net Annual Cost(Savings) after Avoided Cost, Accounting for Current Program, 4-Yr LTO	**$$/Yr**	**($9,853)**

Beverage Containers

Recommendation: Commingled containers to a covered rolloff container, marketed for processing by a southeastern Massachusetts MRF.

Estimated Cost of Beverage Container Recycling Program, BSC		
Item	**Units**	**Value**
Estimated Container Generation	Tons/Yr	40
Estimate Current Recycling Tonnage	Tons/Yr	5
Recycling Rate with Aggressive Program	Percent	60%
Estimated Recovery with Aggressive Program	Tons/Yr	24
Current Program		
Hauls Per Year	Hauls/Yr	6
Cost Per Haul	$$/Haul	$332
Total Cost of Program	$$/Yr	$1,992
Rolloff Container		
Purchase	$$	$6,000
Lease-to-Own, 4 Yr	$$/Yr	$1,826
Haul to MRF	$$/Haul	$220
Tons per Haul to MRF	Tons/Haul	2.0
Per Ton Processing Charge	$$/Ton	$70
Avoided Disposal Cost (Haul + Tip)	$$/Ton	$100
Avoided Disposal Cost with Current Recycling Tonnage	$$/Yr	$500
Avoided Disposal Cost, Total with Aggressive Program	$$/Yr	$2,400
Annual Cost with Rolloff Purchase	**$/Year**	**$7,200**
Annual Cost with 4 Year Lease-to-Own	**$/Year**	**$9,026**
Annual Cost(Savings) after Avoided Disposal, Purchase	**$/Year**	**$4,800**
Annual Cost(Savings) after Avoided Disposal, 4-Yr LTO	**$/Year**	**$6,626**
Annual Cost(Savings) after Avoided Disposal, Accounting for Current Program, Purchase	**$/Year**	**$2,308**
Annual Cost(Savings) after Avoided Disposal, Accounting for Current Program, 4-Yr LTO	**$/Year**	**$4,134**

Recommendation: Purchase additional recycling containers

Cost of Recommended Recycling Supplies, Bridgewater State College			
Item	**Number**	**Unit Cost**	**Total Cost**
Deskside recycling bins	150	$4.50	$675
18-Bushel hampers	20	$175	$3,500
95-gallon wheeled recycling containers with slot tops (Schaefer or equivalent)	10	$100	$1,000
"Slim Jim" recycling containers, 1/2 with paper slot tops, 1/2 with can tops	50	$50	$2,500
Total			**$7,675**